

CLAIMS

What is claimed is:

1. A locking pin comprising:
 - a sleeve, the sleeve having:
 - a base, the base having:
 - a mating side, the mating side having:
 - a castled perimeter, the castled perimeter having:
 - a retention groove in an interior surface of the castled perimeter,
 - a first rotation limiting channel or pin, and
 - a first locked indicator on a top surface of the castled perimeter,
 - a projection side opposite the mating side, the projection side having:
 - an anti-rotation protrusion, wherein the anti-rotation protrusion is mate-able into a keyed opening in a first planar mount to prevent rotation of the sleeve, and
 - a cam opening through a central portion of the base,
 - an expandable projection coupled perpendicular to the projection side of the base, the expandable projection having:
 - a cylindrical portion coupled to the projection side of the base,
 - a conical portion, the conical portion having a first end that is coupled to the cylindrical portion,
 - an expandable opening traversing across the expandable projection to define an expandable projection interior surface, the expandable projection interior surface having:
 - a cam retaining bulge; and
 - a bullet nose coupled to a second end of the conical portion; and
 - a locking cam unit, the locking cam unit having:

28 a thumb grip,
29 a cam unit disk coupled to the thumb grip, the cam unit disk having:
30 a first side coupled to the thumb grip, the first side having:
31 a second locked indicator,
32 a retention lip, wherein the locking cam unit fits inside the
33 cam opening of the sleeve, such that the retention lip mates
34 into the retention groove to secure the locking cam unit
35 inside the sleeve while allowing the locking cam unit to
36 freely rotate, and
37 a second side, the second side having:
38 a second rotation limiting channel or pin, wherein
39 the first rotation limiting channel or pin and the
40 second rotation limiting channel or pin mate a pin
41 into a channel to limit a rotation of the cam unit
42 disk, and
43 a locking cam coupled to the cam unit disk, the locking cam having:
44 an elliptical shape having a width and two ends, and
45 a concave indentation in each of the two ends, wherein the width
46 of the elliptical shape is sufficient to press and lock against one of
47 the concave indentations against the cam retaining bulge, thus
48 causing the expandable projection to expand outward and to
49 prevent the locking cam unit from rotating.

1 2. The locking pin of claim 1, wherein the locking cam provides a tactile feedback when the
2 concave indentation locks against the cam-retaining bulge.

1 3. The locking pin of claim 1, wherein if the locking pin is inserted through the first planar
2 mount and a second planar mount and the first and second planar mounts are contiguous, the
3 expandable projection expands to lock the first and second planar mounts together by forcing the
4 expandable projection against the second planar mount and by forcing the projection side of the
5 base of the sleeve against the first planar mount.

1 4. The locking pin of claim 1, wherein the first and second lock indicators are aligned when
2 the concave indentation presses and locks against one of the concave indentations to lock the
3 locking pin.

1 5. The locking pin of claim 1, wherein the sleeve is a first color and the locking cam unit is
2 a second color, wherein the first and second colors are selected to provide a quick visual
3 reference identifying the locking pin as a locking pin, and the different first and second colors
4 providing a visual cue to a user of the sleeve remaining fixed while the locking cam unit is
5 rotated.

1 6. The locking pin of claim 1, wherein the locking pin is composed of only material that is
2 electrically non-conductive.

1 7. A locking pin comprising:
2 a sleeve, the sleeve having:
3 a base, the base having:
4 a mating side,
5 a projection side opposite the mating side, and
6 cam opening through a central portion of the base, and
7 an expandable projection coupled to the projection side of the base, the
8 expandable projection having:
9 an expandable opening traversing across the expandable projection to
10 define an expandable projection interior surface;, the expandable
11 projection being oriented normal to the protrusion side of the base; and
12 a locking cam unit, the locking cam unit having:
13 an elliptical shape having a width and two ends, wherein the width of the elliptical
14 shape is sufficient to press the locking cam against an interior of the expansion
15 projection.



1 8. The locking pin of claim 7, wherein:

2 the expandable projection interior surface has a cam retaining bulge, and

3 the locking cam has a concave indentation in each of the two ends of the elliptical
4 shape of the locking cam, wherein the width of the elliptical shape is sufficient to press and lock
5 against one of the concave indentations against the cam retaining bulge, thus causing the to
6 prevent the locking cam unit from rotating.

1 9. The locking pin of claim 8, wherein the locking cam provides a tactile feedback when the
2 concave indentation locks against the cam-retaining bulge.

1 10. The locking pin of claim 9, wherein:

2 the mating side of the base further comprises:

3 a castled perimeter, the castled perimeter having:

4 a retention groove in an interior surface of the castled perimeter, and

5 a first rotation limiting channel or pin,

6 the projection side of the base further comprises:

7 an anti-rotation protrusion, wherein the anti-rotation protrusion is mate-able into a
8 keyed opening in a first planar mount to prevent rotation of the sleeve,

9 the expandable projection further comprises:

10 a cylindrical portion coupled to the projection side of the base,

11 a conical portion, the conical portion having a first end that is coupled to the
12 cylindrical portion, and

13 a bullet nose coupled to a second end of the conical portion; and

14 and wherein in the locking cam unit:

15 the cam unit disk further comprises:

16 a first side coupled to the thumb grip, the first side having:

17 a retention lip, wherein the locking cam unit fits inside the cam
18 opening of the sleeve, such that the retention lip mates into the
19 retention groove to secure the locking cam unit inside the sleeve
20 while allowing the locking cam unit to freely rotate, and

21 a second side, the second side having:
22 a second rotation limiting channel or pin, wherein the first rotation
23 limiting channel or pin and the second rotation limiting channel or
24 pin mate a pin into a channel to limit a rotation of the cam unit
25 disk.

1 11. The locking pin of claim 10, wherein:
2 the mating side of the castled perimeter of the base further comprises a first locked
3 indicator on a top surface of the castled perimeter, and
4 the cam unit disk of the locking cam unit further comprises a second locked indicator, wherein
5 the first and second lock indicators are aligned when the concave indentation presses and locks
6 against one of the concave indentations to lock the locking pin.

1 12. The locking pin of claim 11, wherein the sleeve is a first color and the locking cam unit is
2 a second color, wherein the first and second colors are selected to provide a quick visual
3 reference identifying the locking pin as a locking pin, and the different first and second colors
4 providing a visual cue to a user of the sleeve remaining fixed while the locking cam unit is
5 rotated.

1 13. The locking pin of claim 12, wherein the locking pin is composed of only material that is
2 electrically non-conductive.